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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,128	05/19/2006	Michael Holzemer	LYBZ 2 00104	9229
27885	7590	08/28/2009		
Fay Sharpe LLP 1228 Euclid Avenue, 5th Floor The Halle Building Cleveland, OH 44115			EXAMINER KASTURE, DNYANESH G	
			ART UNIT	PAPER NUMBER
			3746	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/580,128

**Applicant(s)**

HOLZEMER ET AL.

**Examiner**

DNYANESH KASTURE

**Art Unit**

3746

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 19 May 06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 10 are objected to because of the following informalities: The lower limit pressure has been referenced as  $p_2$  in the drawings and in the specification and also in Claim 2 however, it has been referenced as  $p_s$  in Claim 10. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In Re Claim 1, the word "comprising" has been deleted, however it should not have been deleted because the method has more than one step: 1) storing a curve 2) determining an inlet pressure and so on. Further, the term "upper speed value" in claims 1, 3 and 10 is indefinite because it is not clear what the upper speed is in relation to (normal speed or lower speed). It is suggested that a statement specifying that the speed value  $n_1$  is greater than speed value  $n_2$  and that  $n_1$  and  $n_2$  are upper and lower limits of speed would help clarify what upper and lower speed is.

5. Further in Re Claims 1, 3 and 10 the phrase "in the alteration range different speed values  $n_v$  being associated with the inlet pressure values  $p$ " is not clear. The following phrase is suggested instead: "wherein each value of inlet pressure  $p$  has a corresponding speed value  $n_v$ ". A similar change is suggested for Claim 12. In addition, with regards to Claims 1 and 3, "determining the speed  $n$  associated with the determined inlet pressure value  $p$  in the curve" is not clear. The following phrase is suggested instead: "determining from the curve, the speed  $n$  corresponding to the determined inlet pressure value  $p$ "
6. In Re Claim 4, it is not clear how the decreasing speeds are associated with decreasing inlet pressure values. It is suggested that the following changes be made: "The method according to Claim 1, wherein the speed  $n_v$  decreases as the corresponding inlet pressure  $p$  decreases in the alteration range."

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
8. Claims 1-6, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnitz et al (US Patent 5,795,328 A) and in view of Gehm et al (US Patent 6,045,331 A)

9. In Re Claims 1 and 2, Barnitz et al discloses a method for controlling (36) a drive motor (16) of a positive displacement type (Column 5, Line29: "pump 14 is a rotary vane pump" which is well known as a type of positive displacement pump – also as acknowledged in applicant's disclosure) vacuum pump (14), comprising:

- determining the inlet pressure  $p$  through pressure signals in the inlet line (12) read by pressure sensor (22)
- operating the motor at a constant upper speed when the pressure values are in an upper range as suggested in Column 5, Lines 36-39: "pump 14 may be temporarily operated, for example at the start up of system 10, at maximum capacity, greater than 500 mm. of mercury, in order to reach more quickly a desired operating vacuum pressure in vacuum line 12". Maximum capacity of the pump implies maximum speed for the drive motor which is a constant value. Therefore for pressures greater than 500 mm, the pump is driven at a constant upper speed value.
- operating the motor at a constant lower speed when the pressure values are in a lower range as stated in Column 4, Lines 45-49: "To produce or to maintain a pressure in vacuum line 12 higher then 100 mm. of mercury--that is, between 0 and 100 mm. of mercury--pump 14 is operated at a CONSTANT SPEED, sufficient, in the absence of any effect of pressure adjusting assembly 20, to maintain a pressure of 100 mm. of mercury in the vacuum line". Therefore for pressures less than 100 mm, the pump is driven at a constant lower speed value.
- operating the motor in an alteration range of inlet pressure values between 100 mm and 500 mm, by varying the speed of the motor. The operating speed of the motor

depends on the pressure sensed by sensor (22) as suggested in Column 4, Lines 54-58: "To produce or to maintain a pressure in the vacuum line 12 less than 100 mm. of mercury--for example, between 100 and 500 mm. of mercury--valve 34 is closed and the speed of pump 14 is VARIED to adjust the pressure in the vacuum line to the desired value"

10. It is clear that any value read by the sensor between 100 mm and 500 mm will have a corresponding speed that the motor is operated at, nevertheless, Gehm et al discloses a fluid pump speed controller with self calibration which determines the value of vacuum pressure for each value of speed in a range of operating speeds. The pump is run at full speed and then SLOWED down in 1 HZ increments every 10 seconds until a 0.2" Hg DROP in vacuum level is recorded (Column 4, Lines 17-23).

11. It would have been obvious to a person having ordinary skill in the art at the time of the invention to calibrate a curve that relates the inlet pressure to the speed that the motor of Barnitz et al should be operated at as suggested by Gehm et al and adjust the speed to the appropriate value corresponding to the desired value of pressure for the purpose of adjusting the pressure in the vacuum line to the desired value (open loop control).

12. Note the following additional disclosures of Gehm et al: "vacuum pumps that have a minimum allowable operating speed" – Column 2, Line 25. Gehm et al also discloses a first setpoint where pump is operated at minimum speed (reads on constant lower speed value), and a third setpoint where the pump is operated at the maximum speed for the electric motor (reads on constant upper speed value). The maximum

speed is for pressure values larger than an upper limit pressure and the minimum speed is for pressure values lower than a lower limit pressure. Anything in between is for occasional transients.

13. In Re Claim 3, Barnitz et al and Gehm et al as applied to Claims 1 and 2 disclose all the claimed limitations.

14. In Re Claim 4 and 12, since the pump of Barnitz et al is operated at constant speed between 0 and 100 mm of Hg (mercury), all speeds of operation between 100 mm and 500 mm are greater than this minimum constant speed. Further, Column 4, Lines 17-23 of Gehm et al states that the slowing down of the motor causes a drop in vacuum level, suggesting that decreasing speeds are associated with decreasing inlet pressure.

15. In Re Claims 5 and 6, it would have been obvious to a person having ordinary skill in the art to operate the speeds in the claimed ranges at the pressures in the claimed ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art – MPEP 2144.05 (II-A).

16. Claims 7, 8, 10, 11, 13, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnitz et al (US Patent 5,795,328 A) in view of Gehm et al (US Patent 6,045,331 A) and further in view of Rousseau et al (US Patent 6,419,455 B1)

17. In Re Claim 7, Barnitz et al modified by Gehm et al as applied to Claim 1 discloses all the claimed limitations except for a high vacuum pump arranged downstream from the positive displacement pump. (Since the sensor and the positive displacement pump are both disposed on the suction side of a would be modification of a high vacuum pump, the inlet pressure is read on the suction side of the high vacuum pump.)

18. Nevertheless, Rousseau et al discloses a primary pump (4) and a secondary pump (5) disposed upstream of the primary pump. Column 4, Lines 38-39 of Rousseau et al state that the secondary pump can also be a Roots pump (positive displacement pump). Rousseau et al also discloses a pressure sensor (7) upstream from the secondary pump and a pressure sensor (7') upstream from the primary pump.

19. It would have been obvious to a person having ordinary skill in the art at the time of the invention to add a high vacuum pump as taught by Rousseau et al downstream from the rotary vane pump of Barnitz et al for the purpose of enhancing the pumping capability of the vacuum apparatus.

20. In Re Claim 8, Rousseau et al discloses an automation card that can include mathematical rules between pressures and parameters which govern the instantaneous



speed profiles (Column 5, Lines 35-40). The relationship between pressure and speed can be stored on this card and be used to determine values of speed corresponding to inlet pressure.

21. In Re Claim 10, the apparatus of Barnitz et al modified by Gehm et al and Rousseau et al performs the method of claims 1, 2, 7 and 8. In accordance with MPEP 2112.02, under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device.

22. In Re Claim 11, Barnitz discloses a processor (38) that processes and evaluates the pressure signal from the sensor.

23. In Re Claim 13, Barnitz et al modified by Gehm et al and Rousseau et al as applied to Claims 3 and 7 disclose all the claimed limitations.

24. In Re Claim 14, Barnitz et al modified by Gehm et al and Rousseau et al as applied to Claims 3 and 8 disclose all the claimed limitations.

25. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnitz et al (US Patent 5,795,328 A) in view of Gehm et al (US Patent 6,045,331 A) and further in view of de-Simon et al (US Patent 5,971,725 A)

26. In Re Claim 9, Barnitz et al modified by Gehm et al as applied to Claim 1 discloses all the claimed limitations except for an asynchronous motor to power the pump.

27. Nevertheless, de-Simon et al discloses in Column 5, Lines 24-25 that a vacuum pumping device incorporates a 3 phase AC asynchronous motor.

28. It would have been obvious to a person having ordinary skill in the art at the time of the invention to use an asynchronous motor as taught by de-Simon et al to drive the pump of Barnitz et al as a suitable design choice due to its successful application in the prior art. If the modification leads to anticipated success, it is likely the product of ordinary skill and common sense and not the product of innovation.

29. In Re Claim 15, Barnitz et al modified by Gehm et al and de-Simon et al as applied to Claims 3 and 9 disclose all the claimed limitations.

***Conclusion***

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brazil et al (US Patent 6,537,033 B2) discloses an open loop feedback control system for a vacuum apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272 - 7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Unit 3746

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